

Manufacturing Under License

Licensing is potentially effective tool for corporation, but study shows it must be used with discrimination

BY J. PETER KILLING *

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Developing new products is an expensive and risky business. In a large firm a resounding new product failure can be both expensive and embarrassing. In the smaller firm such an occurrence is more likely to be fatal. One way of avoiding much of the financial risk and market uncertainty of new product development is to manufacture under license. A good license agreement can give a firm technical know-how and patent rights — a proven package of technology — in exchange for a royalty based on sales. Such an agreement safeguards the firm manufacturing under license as the technology is not paid for until the product is actually on the market and selling. The attractiveness of licensing to the small firm was spelled out by a division manager as follows:

"We are using license agreements to move away from our mature products, and this saves us critical years of development time and avoids a lot of uncertainty. We don't mind paying 5 or 10% of sales as a royalty if it means we're on the market a couple of years earlier than we otherwise would be."

This manager's divisional sales were about \$12 million, but even the world's largest firms argue convincingly that licensing makes good sense. No firm can be at the forefront of all the technologies which may affect its business, and licensing is a logical way to supplement an existing in-house research and development program. The vice-president of new product planning and development of Owens-Illinois stated, "Taking a license can be good business in the *appropriate circumstances*. In fact, I predict licensing will be of growing significance and importance." (Emphasis added.)

This article discusses both the "appropriate circumstances" for licensing and the management of license agreements once they are in place. It is based on interviews with Canadian and British manufacturing firms carried out over a two-year period. Figure 1

*Assistant professor, School of Business Administration, The University of Western Ontario, London, Canada.

provides, by way of illustration, information concerning some significant license agreements entered recently by Canadian firms.

LICENSE AGREEMENTS

There are two importantly different types of license agreements. A "current technology" agreement provides for the transfer of know-how and/or patent rights already in the possession of the licensor at the time the agreement is signed. Future developments made by the licensor are not included. Such an agreement was signed in 1972 by the Marsland division of Leigh Instruments with Western Electric to produce teletype terminals. This agreement gave Marsland the rights to produce under approximately 30 Canadian Western Electric patents, and in addition detailed drawings were supplied to Marsland by the licensor. Rights to any further patents or know-how developed by Western after 1972 were not to be transferred to Marsland. Any necessary refinements or developments to the terminal would have to be made by Marsland's own engineers. The only regular communication has been the passing of royalty checks between licensee and licensor from Marsland to Western Electric. Because the license agreement gave no continuing help to Marsland, the firm had to do all its own development work on the terminal and build an area of competence within the firm relating to teletypes. Building this competence cost Leigh several million dollars but the end result was a Canadian market share in excess of 90% and a healthy program of exports.

The second type of license agreement in common use is that in which the licensor provides "current and future" technology to the licensee. This means that any developments made by the licensor relating to the product under license during the term of the license are forwarded to the licensee. In 1961, Rolls Royce entered such an agreement with Continental Motors of the United States to produce light aircraft engines. In order to ensure a smooth continuing flow of information between the two firms, Rolls Royce located an engineer permanently in one of Continental's U.S. plants. The function of this man was to remain abreast of Continental's development work and to transmit this to Rolls' engineers in Crewe in language and concepts with which they were familiar. From this early beginning, a strong relationship developed between the firms and in the early 1970s, a line of engines was introduced to the market which represented the results of a joint development project. Neither firm paid a royalty to the other on these "Rolls-Royce Continental" aircraft engines.

SIGNIFICANT CANADIAN LICENSE AGREEMENTS

Company	Agreement
Bombardier — MLW Ltd.	Bombardier has used license agreements as part of its program to diversify away from dependence on snowmobiles. In 1974 the company licensed subway car technology from CIMT-Lorraine, leading to a \$117.8 million contract to build cars for the Montreal Metro. In 1977 the company has negotiated an agreement with a subsidiary of American Motors to build transit buses. A bid has been made to supply 1,200 of these, worth \$84 million, to Quebec communities.
Leigh Instruments Ltd. — Marsland Division	In 1974 Marsland signed an agreement with Nippon Electric of Japan to produce its optical character recognition (OCR) equipment for the Canadian Post Office. The order (the equipment for reading postal codes) worth over \$12 million, was to be supplied over four years. Marsland was optimistic that the technology could be used as a base for selling post office equipment in other countries, and to expand the basic OCR technology for other uses.
Northern Telecom Ltd.	Recently renewed license agreements with Western Electric to last until 1980. Northern has the largest industrial research laboratories in Canada, yet 50% of sales are still made under license. In 1960 Northern only designed 6% of the products it produced and it is intended that this proportion will rise to 70% by 1978.
Spar Aerospace Limited	Using a license agreement to diversify away from military work. In 1975 signed a license agreement with Carl Hurth of Germany to produce transmissions for streetcars and light rail vehicles. Company was already producing helicopter gears. Subsequent to license agreement \$3.2 million order from the Toronto Transit Commission was received. Company is now examining possibilities of licensing other products from Hurth.

Fig. 1

66 Even these two very brief examples suggest that managing a licensing program varies considerably with the type of license agreements used. In a current technology agreement such as Marsland entered, the licensee must be capable of performing whatever development work is necessary to keep the product competitive. If the technology coming from the licensor has not yet been used in a commercial setting (as would be the case for firms licensing the output of university and/or government laboratories) the licensee would have to be capable of doing the development work necessary to get the product into production. In a future and current technology agreement, on the other hand, there is a great emphasis on choosing an appropriate licensor. It is necessary to judge which firm will be capable of remaining with or ahead of the competition for at least the period of the agreement. This is a much more difficult judgment than that required for a current technology agreement, which involves an assessment of the licensor's existing technology. The licensee with some trained technical staff will be in a better position to make this judgment than that with no such staff.

Transmission Process

The other managerial task falling on firms using future and current technology agreements is the management of the transmission process between the firms. As already mentioned, Rolls Royce went to the extent of placing an employee in the licensor's plant. Most licensees did not go to this extreme, but some did spend considerable effort to forge a firm link between the companies. Contact between the licensors and licensees examined in this study ranged for current and future technology agreements from zero to 275 man days per year, with an average of about 45 days.

The reason for this expensive activity is that a lot of the information required by the licensee is not embodied in the drawings and specification sheets supplied by the licensor. This information is only in the minds of the men who work for the licensor, and can only be obtained from them through direct personal contact by someone who has a sufficiently similar

LICENSE AGREEMENT TYPES

	Allowed to Export ¹		Product Age ² (years)		
	Yes	No	03	4-10	10+
Current Technology	18	6	20	4	3
Current and Future Technology	6	26	5	14	20
	<u>24</u>	<u>32</u>	<u>24</u>	<u>18</u>	<u>23</u>

¹ The export statistics relate only to products manufactured by Canadian licensees. It is illegal for a licensor to restrict a British licensee from exporting to the EEC.

² Product Age is the time in years between a product's first world introduction and its introduction by the licensee.

Fig. 2

training and background to understand them. Thus, the licensee with technically trained people who can maintain such a contact will again be in a better position than the licensee with no such staff.

There are other differences between the two types of license agreement, these imposed by the licensor. Licensors are not usually willing to give current and future technology agreements on their newer products. In fact, some firms will only exchange information on their new products on a cross licensing basis; that is, in

exchange for other technology, not cash. In addition, when entering current and future agreements licensors will, if legally possible, prevent the licensee from exporting. The rationale for this attitude is readily explained when it is realized that the licensee may be directly competing with the licensor in its export market, and no firm likes to compete with another to which it is regularly giving its latest technological improvements. Data is presented in Figure 2, showing clear differences in product age and exportability by license type.

USING LICENSE AGREEMENTS

Three common uses of license agreements will be discussed. These are: using licenses to strengthen a firm's existing business; to diversify into a closely related product line; and to diversify into a loosely related product line. Both in Canada and Britain there was a clear relationship between the use which a licensee made of the license, and the type of license agreement selected. Figure 3 shows the pattern.

USE OF LICENSE AND LICENSE AGREEMENT TYPE

<i>Use of License</i>	<i>Current Technology</i>	<i>Current and Future Technology</i>
Strengthen Existing Business	16	2
Closely Related Diversification	12	10
Loosely Related Diversification	2	32
	30	44

Fig.3

Clearly, firms which took licenses to strengthen their existing business predominantly chose current technology agreements, those undertaking a loosely related diversification chose current and future agreements, and those implementing a closely-related diversification chose equally among the two. The reasons for these choices and the implications of the choices being made will be discussed in the following sections.

1. Strengthening the Existing Business

There are two distinct motives for firms to enter licensing agreements in areas of existing business. The first arises when a firm is doing research and development in a particular area and finds its way blocked by a patent held by an outsider. The choice open to the firm is to try and design around the patent, at some risk of both time and money, or to try and license it. In some industries this type of licensing is very common, while in others, it is a clear exception to the norm. In the television business, for instance, RCA was a leader in the development of color television and consequently held a great many patents, which the firm was willing to license. For any manufacturer developing a line of color TV sets (such as Electrohome in Canada) it made very little sense to try and design around RCA's patents, especially when licenses were readily available. In such agreements royalty rates were usual-

ly not high, and export restrictions were not imposed.

The second motive for licensing to support an existing business is by and large a matter of adopting industry product standards. It is common in some industries for all firms to use a similar design of certain components, either because the method has proved most efficient and economic, or in order that the customer can buy from several producers and use their products in the same system. Thus, Canron's pipe division pays a small royalty on each iron pipe it produces with a joint fitting patented by one firm in the industry. Most of the other major producers in the business do the same. This license, as with nearly all of those used to strengthen the existing business, involves a current technology agreement.

Conclusion: Licensing to strengthen an existing area of business generally makes practical economic sense. It is an everyday part of business and the practice is often not of outstanding significance to either licensor or licensee. Such a license does not open a new area of business for a licensee, it facilitates operations in the existing business. Nor does such an agreement constrain the licensee. Royalty payments are low and export restrictions virtually nonexistent. There is a preponderance of current technology agreements which means there is not a continuing interface between licensor and licensee which needs management attention.

2. Closely-Related Diversification

Firms introducing products which require product design, production process, and marketing skills, related to skills already existing in the firm, are categorized as following a strategy of closely-related diversification. Thus, in the case of Rolls Royce, the move into light aircraft engines was considered a closely-related diversification. The firm already designed and produced piston engines, and sold equipment to light aircraft manufacturers. The skills needed to design, produce, and sell light aircraft engines were thus related to those already possessed by Rolls Royce.

The motives for using license agreements to implement a strategy of closely-related diversification vary but typically have to do with the speed of getting a product on the market, and the reduction of risk relating to product development. Since the licensee is already using a related technology and selling in a related market, it is generally in a good position to estimate the probable success of the licensed product, and to evaluate the competence of the licensor. This knowledge of product, market, and licensor seems to cause a great enthusiasm for the licensed product by the licensee's employees. There is generally optimism concerning the product's growth potential, and in some cases for other new products which could be developed by the licensee from the basic technology supplied by the licensor. There appears to be a very low occurrence of the "NIH" (not invented here) syndrome which leads a company's employees to be less than enthusiastic about products developed elsewhere.

As shown in Figure 3, licensees following a path of closely-related diversification use both current technology agreements and current and future

technology agreements. This is surprising since these firms are all in similar situations with respect to the degree of strangeness of the new product to them, and especially so when it is realized that most of the firms choosing current and future agreements are limited to manufacturing older products and are generally not allowed to export them. On the other hand, firms using current agreements on a related-product strategy produce relatively young products, are free to export, and are willing to take on products requiring a larger initial capital investment. Interviews with managers in firms using current and future agreements revealed two quite separate reasons for firms in their position to use these agreements rather than current agreements. These are presented below.

(i) *Marketing Dependence.* Four licensees producing consumer goods state that they use license agreements to keep abreast of market developments in the U.S. These license agreements initially provided for a transfer of product design, process know-how and marketing information, but once the design and process are absorbed the licensees' continuing interest is in keeping abreast of styles and colors selling in the U.S. Yearly meetings are held between licensor and licensee to discuss the next year's product line.

(ii) *Upgrading Technical Skills.* Four licensees are using their license agreements to develop in-house product design and production process skills to a level at which the license agreement would no longer be necessary. Three other firms have already completed such a process. Managers of these firms argue that it is a low-risk method of developing such skills, as development capability can be added as sales volume rises. Development funds do not have to be spent in advance of the product being on the market.

By the 1970s, Rolls Royce had already been through the process of upgrading technical skills. Drawing on Continental's knowledge, Rolls built a strong technical capability with respect to light aircraft engines over a 10 year period. It was this fact that permitted the joint development of the latest series of engines, and the fact that it truly was an equal partnership was evidenced by the fact that no royalties were to be paid. One Canadian firm which is now involved in a number of cross-licensing agreements (none of which involve a net

outflow of royalty) has also completed this process after a 20-year period. Given the importance of such a process, and its apparent difficulty, it will be the subject of further research. It would be useful to be able to identify the conditions under which a firm could use licensing agreements to create an in-house technical development competence. On the limited evidence discovered thus far, it appears that a closely related product strategy, a current and future technology agreement, a close attention to the transfer process, and a strong desire to develop an in-house technical competence are all necessary preconditions.

Conclusions: Using license agreements to introduce products related to those already produced by the firm can open significant opportunities. Because the skills needed are related to those existing in the firm, confidence is high and sound judgments can be made with respect to licensor, product, and market. Risk is greater than in the case of licensing to strengthen the existing business, and consequently the need for management attention is greater. Key variables in addition to selection of product are selection of licensor, type of license agreement and attention to the transmission process to capture the "unembodied" technology.

3. Loosely-Related Diversification

Loosely-related diversification is that in which a firm introduces a new product which it has some of the skills to support, but not all. For licensees following this strategy, the missing skill is invariably product design, although often the production process or marketing skill is lacking as well. In sharp contrast to firms licensing closely-related products, these licensees are not at all confident of their new product. This lack of confidence manifests itself in several ways. The licensees are close to unanimous in their choice of current and future technology agreements, which allow them to rely on the licensor as much as possible. They also avoid any projects which involve a significant initial capital expenditure. Because the firms use current and future agreements they are denied access to younger products, which are generally those in the growth stage of the product life cycle. Statistics are shown in Figure 4, contrasting licensees following a loosely related diversification strategy with those discussed previously.

The very low investment figures for loosely-related diversification suggest these licensees generally adopt products which can be made on existing general purpose production equipment, and do not entail an expansion of capacity.

These firms are very selective in the products they

LICENSING USE, PRODUCT AGE, INITIAL INVESTMENT

Licensing Use	Product Age (years)			Initial Investment (\$000's)		
	0-3	4-10	10+	0-50	50-499	500+
Strengthen Existing Business	14	4	0	5	6	3
Closely Related Diversification	7	4	9	4	9	9
Loosely Related Diversification	3	12	14	29	3	2
	24	20	23	38	18	14

Fig. 4

MARKET SIZE AND MARKET SHARE

Licensing Use	Market Size (\$000's)			Market Share		
	0-2,000	2,001-10,000	10,000+	0-39%	40-59%	60%+
Strengthen Existing Business	4	2	6	6	3	2
Closely Related Diversification	2	9	6	6	5	7
Loosely Related Diversification	11	7	1	4	7	8
	17	18	13	16	15	17

Fig. 5

choose to manufacture under license, not so much with respect to the skills required, but rather in terms of market conditions. In Canada in particular the emphasis is on products with small domestic markets, typically protected by a sizable tariff, and serviced only by imports. The licensee can then obtain a high market share through the process of displacing the imports with products manufactured in Canada under license. Figures are shown in Fig. 5 contrasting this strategy with those of other licensees. It is, in short, a niche filling strategy. Find an overlooked market, get a license, supply the market.

Conclusions: Using a license agreement to undertake a loosely-related diversification is not recommended. The lack of confidence of the licensee leads to the use of current and future technology agreements, which restrict the products available and exportability. Products requiring significant initial capital investment are also avoided. The licensee typically settles into a state of permanent dependence on the licensor. If a firm's overall growth is based on using license agreements to produce products to fill niches in a domestic market it soon becomes a very peculiar entity, with a large number of small volume product lines, without the technical competence to support any of them. As tariffs fall this strategy, and possibly any firm using it, will be doomed to extinction.

SUMMARY

Licensing is an activity which must be managed. There are two importantly different types of license agreements and three significantly different uses to which licensing can be put. Recommendations concerning the uses of licensing are summarized below.

- Licensing to strengthen an existing area of business is a relatively low-risk, low-payoff proposition. The costs and benefits of taking a license in such a situation can be calculated with relatively little uncertainty. This use of licensing is straightforward and entirely appropriate.
- Licensing to carry out a diversification requiring skills related to those existing in the firm is also a good use of licensing. Since the area of new business is close to the firm's existing business, judgments covering the new technology and new market are generally well made. Taking the license can save time and reduce risk, without imposing

any significant penalties on the licensee.

This is particularly true if current technology agreements are used. Firms taking licenses to build their own technical strength use current and future technology agreements with the goals of developing eventually to the point where the license is not needed at all.

- License agreements should not be used to produce products which require skills, particularly technical skills, unrelated to those existing in the licensee. Doing so leads to excessive dependence on the licensor as the licensee has no real competence to support the product, and typically does not develop one. Virtually all the agreements used for loosely-related diversification are current and future technology agreements which restrict exports, and are given only for older products. Canadian firms following such a strategy have become niche fillers, with poor prospects for future growth, and as tariffs fall their very existence may be threatened.

Knowing when to license is a prerequisite for a successful licensing strategy. Knowing how to license, being able to identify those areas needing management attention, is also critical. It is clear that the managerial tasks vary with the type of license agreement used. For an agreement involving only the transfer of current technology, the licensee must be capable of:

- Evaluating the existing technology offered by potential licensors.
- Assessing the product's rate of technological change and thus the need for future development work on the product.
- Assessing the firm's own capability to carry out such development work.

The major considerations when entering a current and future technology agreement are somewhat different. The licensee must be capable of:

- Evaluating the existing technology of potential licensees and also their ability to remain abreast or ahead of the competition over the life of the agreement.
- Establishing a reliable transmission process between licensor and licensee, to the point where judgments made by one party can be assessed by the other realistically (in other words, em-

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Factors Affecting Development

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But know-how and trade-secret licenses have their own set of problems. What are the rights in know-how that is not secret? May one collect royalties for use of a trade secret, or enjoin use of a trade secret after it is no longer secret? May one license the use of his know-how only in states west of the Mississippi River, if he can license his patent only for practice there, without violating the antitrust law?

CONCLUSION

The two points of this presentation do not include just deploring the state of the law of intellectual property, deplorable though it is.

One objective is to point out, convincingly I hope, that those who would profit in the market for this property must be sophisticates in the reality of the law in action, which is markedly different from the theory of the law as written in the individual statutes and cases.

The second point is to observe that, with all the special burdens which the law places upon patent enforcement apart from massive packages of know-how which private inventors rarely if ever have, it must be at least questionable whether the concept of developing and marketing that leftover portion of the work of the private inventor which he does not himself market, is viable as an independent business concept for a company not looking for solutions to problems in its own familiar market.

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Technology Imports — Japanese Style

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scientists. This emphasis would appear to be well suited to the widespread diffusion of technical innovations, though perhaps not so well suited to the initial development of technically-advanced products, which is an area where Japan continues to be fairly weak.

In summary, I think it can be safely said that if any developing countries are looking for proof that foreign technology induction can contribute to a country's exports and overall economic growth, they will find it in Japan. Japan's case also supports the proposition that extensive and well reasoned government controls over the technology imported are not inconsistent with success. The third lesson of Japan, and the one which

appears to be the most difficult for developing countries to learn and apply, is that a country importing technology can derive substantial benefits from it only if the country organizes itself domestically to do so, through education of its people, investment in plant and research and development, and close cooperation between business and government.

Involuntary Transfer of Technology

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salesman more difficult than it already is, but he must be stopped from disclosing proprietary technology gratuitously. It's suicidal.

Years ago, I saw companies from all over the OECD countries compete for the job of building a power station in a country of Eastern Europe. The communist authorities, like inveterate capitalists, played off each competitor against the others very skillfully. In the end, they knew everything there was to know about the Western World's ways of building a power station. The order, of course, went to the Soviet Union.

There is not much I can offer you as a general conclusion. There are no ironclad rules governing all these cases of involuntary or unavoidable transfer of technology. It may be possible to avoid or to alleviate detrimental effects if their origin is recognized. To make you aware of the problem has been the purpose of my remarks.

Know-How Protection in the U.K.

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Now that the U.K. is a member of the European Economic Community, we are also governed by the Rome Treaty and the notorious Article 85.

The Brussels Commission has not yet issued overall guidelines as to which restrictions are permissible in a know-how license and there is little assistance available as to whether a given restriction will receive negative clearance. However, one decision of the Commission (Re: Burroughs-Delaplanque) gives some guidance and the agreement in question, relating to plasticized carbon paper, was held not to constitute a restriction on competition insofar as it required Delplanque:

1. Not to use the know-how after the end of the agreement.
2. Not to communicate the know-how to third parties during the period the agreement is in force and for 10 years thereafter.
3. Not to grant sub-licenses in respect of the know-how except to its wholly-controlled subsidiaries.

Secrets, Know-How Under Siege

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11. Point I.A.2 of the Commission's 1962 Official Notice on Patent Licensing Agreements (the so-called "Christmas Message"), J.O. No. 139 of December 24, 1962, CCH Com.Mkt.Rep. ¶2698.
12. Article 1.1, point 6, DReg 2. Note, however, that DReg 1 would for all practical purposes, have disqualified a field of use clause regarding licensed patents by virtue of its Articles 1.1, point 6 and 2., point 3. Without judging the overall merits of DReg 2, this, at least, is a positive change.
13. Article 2, point 13, DReg 1, and Article 2, point 11, DReg 2. Under the latter provision, the qualifier is added that the licensor could require the licensee to pay an appropriately higher royalty rate where the licensed secret process or know-how is used for purposes other than those specified in the contract.
14. Very high ranking officials of the U.S. Justice Department have quite recently stated this to be their personal view.
15. It should, however, be mentioned that a poorly reasoned lower court California decision has held otherwise, rejecting the *Listerine* case. See *Choisser Research Corp. v. Electronic Vision Corp.*, 173 U.S.P.Q. 234 (Cal.Sup.Ct., San Diego Cty., 1972).
16. Article 3, point 1 of DReg 1 states that an agreement would not qualify for group exemption if it contained "an obligation on the part of the licensee to refrain from contesting the licensed patent or other rights of the licensor" (emphasis added). Article 2, point 1 of DReg 2 would disqualify an agreement containing an "obligation on the part of the licensee to refrain from contesting the licensed patent or other exclusive rights of the licensor." (emphasis added). Whether the insertion of the word "exclusive" in DReg 2 was intentional, and exactly what it is supposed to mean, is questionable. It can be argued that a trade secret or know-how is not an "exclusive right" and thus,

a clause in a patent/know-how license prohibiting the licensee from contesting the validity, secrecy, or the licensor's ownership and right to license the trade secret or know-how would not disqualify the agreement from group exemption. This is quite probably not what the Commission draftsman intended, though in our view, this should be the case. Trademarks, being exclusive rights, would be covered by the prohibition against non-challenge clauses, though it should not be, in our view.

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ployees of the two firms must get to know one another to the point where they are aware of each other's strengths and weaknesses).

- (iii) Assessing the degree to which the licensee will become dependent on the licensor, and the likely effect on the firm of such a dependence.

It is clear that licensing using either type of agreement will be easier for those firms which have some technical skills related to the new product area. This will make assessment of the licensor's technology much easier and the transmission process will be both easier and more effective if the communication is between people of similar technical background and training.

To license effectively, a manager must learn both when to license and how to license. This article has addressed in some detail both of these issues. Licensing can be a very effective corporate tool but it must be applied with discrimination.